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ABSTRACT

It has been hypothesized that a student will develop more fully academically if grouped with students of similar ability. A study was undertaken at Harcum Junior College to assess the effect upon academic performance of the assignment of roommates with varying high school academic records. For investigation purposes students were identified as above average, average, and below average. Four groups were then formed: Group I paired above average students with average students; Group II, average with average; Group III, above average with below average; and Group IV, below average with below average. Analysis of results indicated that significantly higher levels of academic achievement could be attained by average and below average achievers by assigning them as roommates to above average academic achievers. (CK)

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Roommate-Impact Upon Academic Performance

1. The most frequently offered justification for ability tracking in education is the assumption that the student will develop better academically if grouped with students of similar ability.

"Although there has not been much research done on the effects of ability tracking in higher education, the available evidence indicates that it does not work: the intellectual development of the bright student is apparently not impeded if he attends a relatively unselective college, nor is the development of the less able student adversely affected if he attends a highly selective college." (See Alexander W. Austin, "Undergraduate Achievement and Institutional 'Excellence'." Science 161, 1968, 661-668, and Robert C. Nichols, "Effects of Various College Characteristics on Student Aptitude Test Scores." Journal of Educational Psychology 55. 1964, 45-54) (1)

2. Specifically at Harcum, what is the effect upon academic performance, if any, of the assignment of roommates with varying high school academic records? To answer this question, three groups of September 1970 freshmen were assigned roommates on the basis of earned high school quality-point averages and their Harcum programs of study. The small size of the sample group (14 each) was dictated by the availability limitation in "matched" curriculums of larger numbers in all of the groups.

3. For the purposes of this investigation, students with a 3.0 or better average (on a scale of A = 4; B = 3; C = 2; D = 1) were identified as "Above Average;" those with 2.3 through 2.9 as "Average," and those with less than 2.3 as "Below Average."

4. Group 1 (Experimental A) consisted of 7 students in the "Above Average" group assigned 7 roommates in the "Average" group. Group 2 (control A) contained 7 students in the "Average" group assigned 7 roommates also in the "Average" group. Group 3 (experimental B) consisted of 7 "Above Average" students assigned 7 "Below Average" students as roommates, and Group 4 (control B) consisted of 14 "Below Average" students as roommates. The Harcum-earned first-semester quality-point averages were compared statistically for the four groups to ascertain if Group 1 would earn significantly higher averages than Group 2, Group 2 than Group 4, and Group 3 than Group 4.

(1) College Review Board, Summer 1970 - No. 76, p. 4

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5. The most common problem in research perhaps, is to determine whether two samples differ sufficiently in one or more characteristics to discredit the hypothesis that the samples are from populations similar in the characteristic(s) chosen for comparison. The purpose of a test of significance is always to determine the probability that an observed difference between two independent samples could result from the fluctuations of random sampling, (so-called "sampling errors"). To accept the so-called "null hypothesis" is to conclude that the observed difference is due to chance (so-called "sampling errors"). To reject the null hypothesis is to conclude that the difference is nonchance or real.

6. To determine whether or not statistically significant (i.e. "real") differences existed between the samples comprising Groups 1, 2, 3 and 4, the following formulas were applied to the data, which was the means of the quality-point averages earned by the four groups for their first semester.

Formula #1 $$\sigma_D = \sqrt{\sigma^2 M_1 + \sigma^2 M_2}$$

σ_D = The standard error of the difference between two means

Formula #2 D/σ_D, in which D is the difference between the averages of the two groups compared.

An obtained difference between two averages is considered to be "significant" where the odds (or chances in 100) are great that the true difference between the groups is greater than zero. It is customary to take a D/σ_D of 3 as indicative of virtual certainty that the true difference between the two groups is greater than zero. (Stated in terms of probability when D/σ_D equals 3, there is only 1 chance in 1000 that the true difference between the two groups is not greater than zero.) A D/σ_D greater than 3 may be taken as indicating just so much additional security that the true difference between the two groups is greater than zero.

7. The chances in 100 of significant differences in quality-point averages between these groups are summarized in the following table.

Table I
Quality-Point Averages - The Reliability of the Difference Between Groups

GROUPS	D/σ_D	Chances in 100
Group 1 & Group 2	4.4	100
Group 3 & Group 4	2.9	100
Group 2 & Group 4	4.1	100

8. As Table 1 clearly reveals, all of the noted group differences in grade-point averages earned are most definitely statistically "significant." (These differences evidently are not due to sampling errors.)

9. The group grade-point average for the "Average" students who were roommates of "Above Average" students was 3.2; whereas it was only 2.6 for the all - "Average" group. The group grade-point average for the "Below Average" students who were roommates of "Above Average" students was 2.1; whereas it was only 1.9 for the all - "Below Average" group.

10. These results indicate that when "Above Average" students are assigned as roommates for "Average" students, the academic performance of the group is significantly higher than a comparable-sized group of all-"Average" roommates. Similar results are noted when "Above Average" students are assigned as roommates for "Below Average" students, as compared with a comparable-sized group of all-"Below Average" roommates.

11. It is therefore concluded that in terms of attaining higher levels of academic achievement, as reflected in earned grade-point averages; to the extent practicable, "Above Average" academic achievers in high school should be assigned as roommates for "Average" and "Below Average" achievers.

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